APPENDIX I:

Boring Logs



Project:

169.2 Bridge Street (150 Massmills Drive), Lowell, MA GEC project 1785-5040

Boring Log ID: $\underline{B-1/GEC-1}$

Date of Work: 8-14-2015

Weather: High 70°F's, sunny, slight breeze

Boring Location 3.5' from edge of Picker Building and 63'

Sheet: $\underline{1}$ of $\underline{1}$

from concrete ledge along Concord River

Boring Contractor: New England Geotech, LLC

Foreman: Maynor/Kyle

GEC Engineer: M. Bradley/A. Suding

Drilling Method: Geoprobe 6620DT Track mounted

Sampling: Continuous in five foot intervals with dedicated acetate Sleeves

Screening Equipment: <u>Ion Science TIGER 10.6 eV PID</u>

]	KEY		= Interva	ıl sampleo	l for analysi	S Cement Seal: Bentonite S	eal: Sand Pack:	Slotted Screen:
Depth		SAMPL	E	Strata Change	Sample Screening	SAMPLE	ADDITIONAL	WELL
De	No.	PEN./REC.	DEPTH	Change	Screening	DESCRIPTION	NOTES	CONSTRUCTION
	1	60/34	0-5'		0-5' = 0.0 ppmv	S-1: Dry 0-34" Olive gray to light brown SILT containing urban fill material (brick, concrete pieces, roots, glass, coal ash), poorly sorted	Samples collected for laboratory analysis: B-1 (15-20')	
5'		CO 12 O	5.103	SILT		S-2: Dry 0-23" Light gray to yellowish orange SILT containing urban fill material (coal ash, brick, concrete) and some angular gravel shale pieces	ЕРН/VРН	
	2	60/30	5-10'		5-10' = 0.0 ppmv	23-25" Light gray CLAY, stiff 25-27" Yellowish-orange, fine to medium SAND, moderately sorted, subrounded 27-28" Olive gray to greenish gray CLAY,		
10'	3	60/13.5	10-15'	CLAY/ SAND		very stiff 28-30" Light gray fine to coarse SAND with fine to coarse gravel and urban fill material (ash, concrete), poorly sorted		
10	3	60/13.3	10-13	SILT	10-15'= 0.0 ppmv	S-3: Wet @ ~13' 0-3.5" Dark gray to yellowish-orange SILT containing urban fill material (brick, small (1-2") metal pieces, coal ash), poorly sorted, dry 3.5-8.5" Dark gray SILT with clay, little brick and coal ash, moist		
15'	4	60/22	15-20'	SILT/ CLAY	15-20' = 0.0 PPMV	8.5-11"Yellowish-orange SILT, well sorted, wet 11-13.5" Olive gray SILT with fine to coarse sand and clay, poorly sorted, wet		
-				SAND	0.011.111	S-4: Wet, petroleum stain/odor at ~19' 0-1"Olive gray SILT with fine to coarse sand and clay, poorly sorted 1-3" Light gray to yellowish orange SILT		
20'						and CLAY, well sorted 3-19" Dark gray to yellowish orange SILT and CLAY with fine to coarse sand and some angular cobbles interbedded toward the bottom of the sequence, petroleum staining and odor toward end of sequence 19-22" Light gray fine SAND, well sorted, medium dense, possible gleying	depth of approximat screen and ~15' of r	2" monitoring well to a ely 22' BSG with 10' of iser. Completed with 4" Designated GEC-1.



Project:

169.2 Bridge Street (150 Massmills Drive), Lowell, MA GEC project 1785-5040

Boring Log ID: $\underline{B-2}$

Date of Work: 8-14-2015

Weather: High 70°F's, sunny, slight breeze

Boring Location 3.5' from edge of Picker Building and 45'

Sheet: $\underline{1}$ of $\underline{1}$

from concrete ledge along Concord River

Boring Contractor: New England Geotech, LLC

Foreman: Maynor/Kyle

GEC Engineer: M. Bradley/A. Suding

Drilling Method: Geoprobe 6620DT Track mounted

Sampling: Continuous in five foot intervals with dedicated acetate Sleeves

Screening Equipment: <u>Ion Science TIGER 10.6 eV PID</u>

KEY: = Interval sampled for analysis

KEY: = Interval sampled for analysis									
Depth	No.	SAMPI PEN./REC.	<u>.</u> Е Дертн	Strata Change	Sample Screening	SAMPLE DESCRIPTION	ADDITIONAL NOTES	WELL CONSTRUCTION	
	1	60/34	0-5'	TOPSOIL URBAN FILL	0-5' = 0.0 ppmv	S-1: Dry 0-10" TOPSOIL 10-31" Dark gray to light gray to red brown URBAN FILL consisting of crushed concrete with brick and silt layers 31-34" Yellowish orange SILT with fine	Refusal at ~11'. Four additional attempts in the vicinity also hit refusal.	N/A	
5'				SILT		sand and angular concrete pieces, moderately sorted			
	2	60/24	5-10'	URBAN FILL	5-10' = 0.0 ppmv	S-2: Dry 0-19" Light gray to olive gray to red brown URBAN FILL consisting of crushed concrete with brick and silt and fine to medium sand layers, poorly sorted			
10'				SILT		19-20.5" Light gray SILT, well sorted 20.5-24" Dark gray fine to medium SAND, some fine gravel, well sorted			
-									



Project:

169.2 Bridge Street (150 Massmills Drive), Lowell, MA GEC project 1785-5040

Boring Log ID: $\underline{B-3/\ GEC-2}$

Date of Work: 8-14-2015

Weather: High 70°F's, sunny, slight breeze

Boring Location: 8' south and 4' west of the southwest

Sheet: $\underline{1}$ of $\underline{1}$

corner of the oil pump house

Boring Contractor: New England Geotech, LLC

Foreman: Maynor/Kyle

GEC Engineer: M. Bradley/A. Suding

Drilling Method: Geoprobe 6620DT Track mounted

Sampling: Continuous in five foot intervals with dedicated acetate Sleeves

Screening Equipment: <u>Ion Science TIGER 10.6 eV PID</u>

Screen:	Slotte	eal: Sand Pack:	Gement Seal: Bentonite Sea	d for analysis	l sample	= Interva	7:	KEY	
ELL RUCTION		ADDITIONAL NOTES	SAMPLE DESCRIPTION	Sample Screening	Strata Change		SAMPL		Depth
.oc non	CONST	Samples collected	S-1: Dry		SILT	DEPTH	PEN./REC.	No.	Ď
		for laboratory analysis:	0-13" Olive gray SILT containing urban fill material (brick, coal ash, concrete), moderately sorted	0-5' =	SAND	0-5'	60/45	1	
		B-3 (15-20') EPH/VPH & B-3 (15-20') (25- 28")	13-21" Light gray to yellowish orange fine SAND with little coarse sand, moderately sorted 21-45" Light gray to yellowish orange to	0.0 ppmv					
		Petroleum Fingerprint TPH 8015	dark gray URBAN FILL consisting of crushed concrete, coal ash, and brick and interbedded sand and clay	5 10? -	URBAN FILL	5-10'	60/31	2	5'
		11110010	S-2: Dry 0-31" Light gray to yellowish orange URBAN FILL consisting of crushed concrete and brick and interbedded silt, little clay	5-10' = 0.1 ppmv					
			S-3: Dry to moist	 -		10-15'	60/31.5	3	10'
			0-5.5" Red brown crushed BRICK 5.5-24.5" Yellowish orange SILT, coarsening upward with clay at bottom of sequence, damp at 22" 24.5-31.5" Light gray crushed	10-15'= 0.1 ppmv	SILT				
∄			CONCRETE, moist	 	CON- CRETE				
			product 0-11.5" Light gray to yellowish orange SILT containing urban fill materials (crushed concrete, brick), stiff, moist 11.5-26" Olive gray to dark gray SILT, well sorted, stiff, wet at ~13", petroleum	15-20' = 0.1 PPMV		15-20°	60/28	4	15'
					SILT				
			possible gleying			20-25'	60/43	5	20'
			S-5: Wet 0-43" Light gray SILT, well sorted, possible gleying	20-25' = 0.1 ppmv					
			S-3: Dry to moist 0-5.5" Red brown crushed BRICK 5.5-24.5" Yellowish orange SILT, coarsening upward with clay at bottom of sequence, damp at 22" 24.5-31.5" Light gray crushed CONCRETE, moist S-4: Wet @ ~17.5', petroleum sheen/ product 0-11.5" Light gray to yellowish orange SILT containing urban fill materials (crushed concrete, brick), stiff, moist 11.5-26" Olive gray to dark gray SILT, well sorted, stiff, wet at ~13", petroleum sheen and free product at 23-26" 26-28" Light gray SILT, well sorted, wet, possible gleying S-5: Wet 0-43" Light gray SILT, well sorted, possi-	0.1 ppmv 15-20' = 0.1 PPMV 20-25' =	CON-		60/28	24:	15'

25'

B-3 completed as a 2" monitoring well to a depth of approximately 25' BSG with 13' of screen and ~15' of riser. Completed with 4" steel standpipe. Designated GEC-2.



Project:

169.2 Bridge Street (150 Massmills Drive), Lowell, MA GEC project 1785-5040

Boring Log ID: $\underline{B-4/\ GEC-3}$

Date of Work: 8-14-2015

Weather: High 70°F's, sunny, slight breeze

Boring Location: 13' south and 5' east of the southeast

Sheet: $\underline{1}$ of $\underline{1}$

corner of the oil pump house

Boring Contractor: New England Geotech, LLC

Foreman: Maynor/Kyle

GEC Engineer: M. Bradley/A. Suding

Drilling Method: Geoprobe 6620DT Track mounted

Sampling: Continuous in five foot intervals with dedicated acetate Sleeves

Screening Equipment: <u>Ion Science TIGER 10.6 eV PID</u>

]	KEY	7:	= Interva	l sampled	l for analysi	S Cement Seal: Bentonite S	eal: Sand Pack:	Slotted Screen:
Depth		SAMPI		Strata Change	Sample Screening	SAMPLE DESCRIPTION	ADDITIONAL NOTES	WELL CONSTRUCTION
a	No. 1	60/39	0-5°	SILT	0-5' = 0.0 ppmv	S-1: Dry 0-39" Dark gray to olive gray to yellowish orange SILT containing urban fill materials (coal ash, brick, crushed concrete) with fine to coarse sand and fine gravel, poorly sorted	Samples collected for laboratory analysis: B-4 (15-20') EPH/VPH &	
5'	2	60/38.5	5-10'	SAND CONCRETE	5-10' =	S-2: Dry to moist 0-3.5" Dark gray fine to medium SAND containing urban fill materials (crushed concrete, brick, coal ash) with fine gravel, poorly sorted, dry 3.5-11.5" Light gray crushed CONCRETE,	B-4 (15-20°)(21- 24") Petroleum Fingerprint TPH 8015	
10'	3	60/41.5	10-15'	SILT	0.0 ppmv	dry 11.5-38.5" Light brown SILT with fine sand and angular gravel (possibly some metal pieces), moderately sorted, dry at top grading to moist at bottom		
				URBAN FILL	10-15'= 0.0 ppmv	S-3: Dry 0-41.5" Light gray to olive gray to yellowish orange URBAN FILL consisting of crushed concrete, brick, and coal ash with interbedded silt		
15'	4	60/30	15-20'	SILT	15-20' =	S-4: Dry to moist, petroleum sheen/odor 0-16" Light gray to yellowish orange SILT containing urban fill materials (crushed concrete, brick) 16-19" Olive gray to dark gray coarse		
20'	5	60/40	20-25'	SAND	0.0 PPMV	SAND with fine subangular gravel and fine to medium sand, damp, petroleum sheen and odor 19-30" Light gray to dark gray to yellowish orange SILT, well sorted, moist		
20		00/40		SILT	20-25' = 0.0 ppmv	S-5: Wet @ 20' 0-40" Light gray SILT, well sorted, stiff, wet, possible gleying	depth of approximat screen and ~14' of r	2" monitoring well to a ely 25' BSG with 14' of iser. Completed with 4" Designated GEC-3.



Project:

169.2 Bridge Street (courtyard), Lowell, MA GEC project 1785-6080

Boring Log ID: $\underline{B-5}$

Date of Work: <u>3-14-2016</u>

Weather: 40°F's, overcast

Boring Location: Eastern side of courtyard

Sheet: $\underline{1}$ of $\underline{1}$

Boring Contractor: New England Geotech, LLC

Foreman: Maynor

GEC Engineer: D. Foley

Drilling Method: Geoprobe 6620DT Track mounted

Sampling: <u>Various intervals with dedicated acetate Sleeves</u>

Screening Equipment: MiniRae 3000 10.6 eV PID

]	KEY	:	= Interva	l sampleo	l for analysi	S Cement Seal: Bentonite S	eal: Sand Pack:	Slotted Screen:
Depth	No	SAMPL		Strata Change	Sample Screening	SAMPLE DESCRIPTION	ADDITIONAL NOTES	WELL CONSTRUCTION
5'	No. 1 2 3 4	Pen./Rec. 12/12 24/16 36/26" 60/44	Depth 0-1' 1-3' 6-11'	URBAN	Due to recovery no head-space was collected	S-1: Dry 0-12" Dark brown SAND & SILT & bits of Coal/ Ash/ Brick S-2: Dry 0-8" Dark brown SAND & SILT with Brick, Coal, Ash, tr organics 8-12"Gray GRAVEL w/ Sand, Silt, Ash, Coal, and Brick 12-16" Dark brown SAND & SILT w/ Ash, Coal, Brick S-3: Dry 0-26" Black COAL DUST w/ Ash and Brick, trace Sand, Silt S-4: Dry to moist, petroleum sheen/odor 0-36" Black COAL DUST w/ Sand, Silt, Ash, and Brick 36-44" Saturated Black Petroleum smeared Soils SAND, Silt, Coal, Ash, Brick	Samples collected for laboratory analysis: B-5 (0-1') PCBs &cogeners B-5 (1-3') PCBs B-5 (0-3') MA14 Metals, EPH w/ PAHs, Pesticides/ Herbicides B-5 (3-6') PCBs B-5 (6-11') PCBs	No wells were constructed during this event
15'								
20								



Project:

169.2 Bridge Street (courtyard), Lowell, MA GEC project 1785-6080

Boring Log ID: B-6

Date of Work: 3-14-2016

Weather: 40°F's, overcast

Boring Location: Eastern side of courtyard, near fuel oil

Sheet: $\underline{1}$ of $\underline{1}$

vaults, Refusal multiple times at around 3' BSG

Boring Contractor: New England Geotech, LLC **Drilling Method:** Geoprobe 6620DT Track mounted

Foreman: Maynor

GEC Engineer: D. Foley

Sampling: <u>Various intervals with dedicated acetate Sleeves</u>

Screening Equipment: MiniRae 3000 10.6 eV PID

	KEY	•	= Interva	l sample	l for analysis	S Cement Seal: Bentonite S	eal: Sand Pack:	Slotted Screen:
Depth	No.	SAMPI Pen./Rec.	LE Depth	Strata Change	Sample Screening	SAMPLE DESCRIPTION	ADDITIONAL NOTES	WELL CONSTRUCTION
5'	No.	Pen./Rec. 12/12	Depth 0-1	URBAN FILL	Due to recovery no Headspace was collected	S-1: Dry 0-12" Dark brown SAND & SILT & bits of Coal/ Ash/ Brick S-2: refusal at Three Foot TEST PIT (0-1'), (1-2'), (2-3') All soils appear to be "URBAN FILL"	Samples collected for laboratory analysis: Due to multiple refusals GEC moved on to B-7, GEC had collected samples from a test pitting event on 3/9/2016 from the (0-1'),(1-2'), (2-3') intervals for the following analysis MA14 metals, PCBs, Pest/Herbicides	No wells were constructed during this event
20'								



Project:

169.2 Bridge Street (courtyard), Lowell, MA GEC project 1785-6080

Boring Log ID: B-7

Date of Work: <u>3-14-2016</u>

Weather: 40°F's, overcast

Boring Location: South west of the Pump House

Sheet: $\underline{1}$ of $\underline{1}$

Boring Contractor: New England Geotech, LLC

Foreman: Maynor

GEC Engineer: D. Foley

Drilling Method: Geoprobe 6620DT Track mounted

Sampling: Various intervals with dedicated acetate Sleeves

Screening Equipment: MiniRae 3000 10.6 eV PID

	KEY	•	= Interva	l sampleo	l for analysis	S Cement Seal: Bentonite S	eal: Sand Pack:	Slotted Screen:
Depth	No.	SAMPI Pen./Rec.	LE Depth	Strata Change	Sample Screening	SAMPLE DESCRIPTION	ADDITIONAL NOTES	WELL CONSTRUCTION
5'	3 3 4	9en./Rec. 12/10 24/16** 36/16**	0-1' 1-3' 6-11'	URBAN FILL	Due to recovery no Headspace was collected	S-1: Dry 0-10" Dark brown SAND & SILT & bits of Coal/ Ash/ Brick S-2: Dry 0-24" Dark brown SAND&SILT w/ Gravel, Coal, Ash, Brick S-3: Dry 0-8" Dark brown COAL, ASH, Brick, Sand and Silt 8-10" White ASH 10-16" Brown SAND&SILT w/ trace Pebble, Coal, Ash, Brick S-4: Dry 0-10" Dark brown SAND & SILT w/ Coal, Ash, Brick 10-21" Brown (mottled) F SAND & SILT Tr. Pebble, Coal, Ash, Brick 21-23" Black COAL DUST 23-33" Gray F SAND w/ Gravel, Bits of Coal, Ash	Samples collected for laboratory analysis: B-7 (0-1') PCBs B-7 (1-3') PCBs & cogeners B-7 (0-3') MA14 Metals, Pesticides/ Herbicides B-7 (3-6') PCBs B-7 (6-11') PCBs and EPH w/ PAHs	No wells were constructed during this event



Project:

169.2 Bridge Street (courtyard), Lowell, MA GEC project 1785-6080

Boring Log ID: B-8

Date of Work: <u>3-14-2016</u>

Weather: 40°F's, overcast

Boring Location: Northwest of the Pump House

Sheet: $\underline{1}$ of $\underline{1}$

Boring Contractor: New England Geotech, LLC

Foreman: Maynor

GEC Engineer: D. Foley

Drilling Method: Geoprobe 6620DT Track mounted

Sampling: Various intervals with dedicated acetate Sleeves

]	KEY	•	= Interva	l sampled	l for analysis	S Cement Seal: Bentonite Se	eal: Sand Pack:	Slotted Screen:
Depth	No.	SAMPL Pen /Rec		Strata Change	Sample Screening	SAMPLE DESCRIPTION	ADDITIONAL NOTES	WELL CONSTRUCTION
5' 10' 20'	No. 3 3 4	Pen./Rec. 12/12** 24/24** 36/30** 60/36*	Depth 0:1' 1:3' 6:11'	URBAN FILL	Due to recovery no Headspace was collected	S-1: Dry 0-12" Dark brown SAND & SILT & Coal/Ash/Brick S-2: Dry 0-12" Brown/ dark brown F SAND& SILT w/ Brick, Coal, Ash 12-14" Black COAL, Ash, Brick 14-16" Brown w white BRICK, Coal, Ash w/ F Sand and Silt 16—24" Dark brown COAL w/ Brick, Ash, F Sand and Silt trace Pebble S-3: Dry 0-12" Brown F SAND & SILT w/ Ash, Coal, Brick 12-36" Dark brown COAL, ASH, BRICK w/ F Sand and Silt S-4: Dry 0-18" Brown F SAND w/ Silt Tr Brick, Coal, Ash 18-29" Tan-gray F SAND w/ Silt tr Brick and Coal 29-33 Gray-tan F SAND w/ tr Pebble and large pieces of Coal 33-36"Brown F-M Sand w/ tr Silt and tr Pebble	NOTES Samples collected for laboratory analysis: B-8 (0-1') PCBs B-8 (1-3') PCBs B-8 (3-6') PCBs B-8 (6-11') PCBs	No wells were constructed during this event
25'								



Project:

169.2 Bridge Street (courtyard), Lowell, MA GEC project 1785-6080

Boring Log ID: $\underline{B-9}$

Date of Work: <u>3-14-2016</u>

Weather: 40°F's, overcast

Boring Location: Northwest of the Smoke Stack

Sheet: $\underline{1}$ of $\underline{1}$

Boring Contractor: New England Geotech, LLC

Foreman: Maynor

GEC Engineer: D. Foley

Drilling Method: Geoprobe 6620DT Track mounted

Sampling: <u>Various intervals with dedicated acetate Sleeves</u>

Screening Equipment: MiniRae 3000 10.6 eV PID

	KEY	•	= Interva	l sample	l for analysis	S Cement Seal: Bentonite S	eal: Sand Pack:	Slotted Screen:
pth	SAMPL No. Pen./Rec.		E	Strata	Sample	SAMPLE	ADDITIONAL	WELL
Del	No.	Pen./Rec.	Depth	Change	Screening	DESCRIPTION	NOTES	CONSTRUCTION
	1	12/12**	0-1		Due to recovery no	S-1: Dry 0-12" Dark Brown F SAND & SILT w/	Samples collected for laboratory	No II
	2	24/24"	1-3'		Headspace was	Shredded Plastic, Coal, Ash	analysis:	No wells were constructed during
					collected	S-2: Dry	B-9 (0-1') PCBs and cogeners	this event
	3	36/26"	3-6'	URBAN FILL		0-4" Black COAL DUST 4-12" Red pulverized BRICK w/ Ash	B-9 (1-3') PCBs	
				TILL		12-24" Dark brown COAL DUST, ASH	B-9 (0-3') EPH with PAHs	
5'						BRICK w F-M Sand w/ tr Silt	B-9 (3-6') PCBs	
	4	60/24"	6-11			S-3: Dry 0-6" Tan-orange weather ROCK, w/ f-m-c	MA14 Metals, Pesticide/	
						Sand tr Coal 6-26" Dark brown– black COAL DUST	Herbicide B-9 (6-11') PCBs	
						w/ Ash, tr Brick f-m Sand and Silt	D-7 (0-11) 1 CDS	
						S-4: Dry		
10'						0-8" Brown F SAND w/ tr Coal, Ash, Pebble, Coal Slag		
						8-16" orange (rusty) f-m SAND w/ Gravel 16-24" Brown F SAND w/ some Brick,		
						Coal, Ash		
15'								
-								
20'								
25'								



Project:

169.2 Bridge Street (courtyard),
Lowell, MA
GEC project 1785-6080

Boring Log ID: B-10

Date of Work: <u>3-14-2016</u>

Weather: 40°F's, overcast

Boring Location: Northwest of the coal elevator

Sheet: $\underline{1}$ of $\underline{1}$

Boring Contractor: New England Geotech, LLC

Foreman: Maynor

GEC Engineer: D. Foley

Drilling Method: Geoprobe 6620DT Track mounted

Sampling: Various intervals with dedicated acetate Sleeves

Screening Equipment: MiniRae 3000 10.6 eV PID

	KEY	•	= Interva	l sample	l for analysis	Cement Seal: Bentonite Sea	eal: Sand Pack:	Slotted Screen:
oth		SAMPL	Æ	Strata	Sample	SAMPLE	ADDITIONAL	WELL
Depth	No.	Pen./Rec.	Depth	Change	_	DESCRIPTION	NOTES	CONSTRUCTION
	1	12/unk	0-1		Due to recovery no	S-1: Dry Small Pile COAL DUST w/ Brick Ash, F	Samples collected	
	2	24/10"	1-3'		Headspace	Sand and Silt	for laboratory analysis:	No wells were constructed during
					was collected	S-2: Dry	B-10 (0-1') PCBs B-10 (1-3') PCBs	this event
	3	36/6"	3-6'	URBAN		0-10" Black COAL DUST w/ Brick, Ash,	B-10 (1-3') PCBS B-10 (0-3') MA14	
				FILL		w F-M Sand and Silt	Metals, Pesticide/ Herbicide	
5'							B-10 (3-6') PCBs	
	4	60/5"	6-11			S-3: Dry 0-6" Black COAL DUST, ASH, BRICK,	EPH w/PAHs B-10 (6-11') PCBs	
						Large piece of Slag	B-10 (0-11) 1 CBs	
						S-4: Dry		
10'						Void Space encountered		
· ·						Small Pile of Black COAL DUST w/ Brick, Ash, Slag		
15'								
20'								
257						ı	,	



Project:

169.2 Bridge Street (courtyard),
Lowell, MA
GEC project 1785-6080

Boring Log ID: B-11

Date of Work: <u>3-14-2016</u>

Weather: 40°F's, overcast

Boring Location: Norther portion of the courtyard, near con-

Sheet: $\underline{1}$ of $\underline{1}$

vergence of picker and Boiler house

Boring Contractor: New England Geotech, LLC

Foreman: Maynor

GEC Engineer: D. Foley

Drilling Method: Geoprobe 6620DT Track mounted

Sampling: <u>Various intervals with dedicated acetate Sleeves</u>

Screening Equipment: MiniRae 3000 10.6 eV PID

	KEY	•	= Interva	l sampleo	l for analysis	S Cement Seal: Bentonite S	eal: Sand Pack:	Slotted Screen:
Depth	No.	SAMPI Pen./Rec.	LE Depth	Strata Change	Sample Screening	SAMPLE DESCRIPTION	ADDITIONAL NOTES	WELL CONSTRUCTION
5'		Pen./Rec. 12/6° 24/12° 36/30° 60/20°	0-1' 1-3' 6-11'	URBAN	Due to recovery no Headspace was collected	S-1: Dry 0-6" Dark brown COAL DUST, w Ash, Bits of Plastic S-2: Dry 0-4" Brown- dark brown COAL DUST, w/ Brick tr F Sand and Silt 4-8" Pulverized ROCK 8-12" Dark brown F SAND & SILT w/ Brick, Coal, Ash S-3: Dry 0-16" Dark brown F SAND & SILT w/ Brick, Coal Dust, Ash 16-26" Brown-tan F SAND & SILT w/ Brick, Coal, Ash, Dust 26-30" Large Pulverized ROCK S-4: Moist 0-20" Dark Brown F SAND & SILT w/ Coal, Brick, Ash, Dust	Samples collected for laboratory analysis: B-11 (0-1') PCBs B-11 (1-3') PCBs and cogeners B-11 (3-6') PCBs MA14 Metals, Pesticide/ Herbicide B-11 (6-11') PCBs EPH w/PAHs	No wells were constructed during this event
20'								



Project:

169.2 Bridge Street (courtyard),
Lowell, MA
GEC project 1785-6080
Boring Log ID: B-11-r10A

Date of Work: <u>3-30-2016</u>

Weather: 40°F's, overcast

Boring Location: Northwest of B-11 on a 10' radius

Sheet: $\underline{1}$ of $\underline{1}$

Boring Contractor: New England Geotech, LLC

Foreman: Maynor

GEC Engineer: D. Foley

Drilling Method: Hand Geoprobe

Sampling: Various intervals with dedicated acetate Sleeves

Screening Equipment: MiniRae 3000 10.6 eV PID

	KEY	7:	= Interva	l sampled	l for analysis	S Cement Seal: Bentonite S	eal: Sand Pack:	Slotted Screen:
Depth		SAMPL		Strata Change	Sample Screening	SAMPLE DESCRIPTION	ADDITIONAL NOTES	WELL CONSTRUCTION
	No. 1	Pen./Rec. 6/0"	Depth 0-1'		Due to recovery no Headspace was collected	S-1: Dry 0-6" refusal X3- Due to presence of "flow-able" concrete on the ground surface	Samples collected for laboratory analysis: No Samples were collected from this location	No wells were constructed during this event
5'								
10'								
15'								
20'								



Project:

169.2 Bridge Street (courtyard), Lowell, MA GEC project 1785-6080

Boring Log ID: B-11-r10B

Date of Work: 3-30-2016

Weather: 40°F's, overcast

Boring Location: Southeast of B-11 on a 10' radius

Sheet: $\underline{1}$ of $\underline{1}$

Boring Contractor: New England Geotech, LLC

Foreman: Maynor

GEC Engineer: D. Foley

Drilling Method: Hand Geoprobe

Sampling: Various intervals with dedicated acetate Sleeves

Screening Equipment: MiniRae 3000 10.6 eV PID

	KEY	:	= Interva	l sampled	l for analysi	S Cement Seal: Bentonite S	eal: Sand Pack:	Slotted Screen:
Depth	No.	SAMPI Pen./Rec.	LE Depth	Strata Change	Sample Screening	SAMPLE DESCRIPTION	ADDITIONAL NOTES	WELL CONSTRUCTION
5'		12/6° 24/12°	0-1' 1-3'	URBAN FILL		S-1: Dry 0-6" Black Coal, Brick, Ash, Bits of Plastic, w/ trace f Sand and Silt S-2: Dry 0-12" Black Coal, Coal Dust, Ash, Brick	Samples collected for laboratory analysis: B-11-r10B (0-1') PCBs B-11-r10B (1-3') PCBs B-11-r10B (0-3') EPH with target PAHs, vanadium	No wells were constructed during this event
15'								
20'								



Project:

169.2 Bridge Street (courtyard), Lowell, MA GEC project 1785-6080

Boring Log ID: B-11-r5A

Date of Work: <u>3-30-2016</u>

Weather: 40°F's, overcast

Boring Location: North of B-11 on a 5' radius

Sheet: $\underline{1}$ of $\underline{1}$

Boring Contractor: New England Geotech, LLC Dri

Foreman: Maynor

GEC Engineer: D. Foley

Drilling Method: Hand Geoprobe

Sampling: Various intervals with dedicated acetate Sleeves

Screening Equipment: MiniRae 3000 10.6 eV PID

	KEY:		= Interva	l sampleo	l for analysis	S Cement Seal: Bentonite S	eal: Sand Pack:	Slotted Screen:
Depth	No.	SAMPL Pen./Rec.	LE Depth	Strata Change	Sample Screening	SAMPLE DESCRIPTION	ADDITIONAL NOTES	WELL CONSTRUCTION
5'		24/4*	0-1' 1-3'	URBAN FILL		S-1: Dry 0-6" Black, Coal, Ash, Brick, Bits of Plastic 6-12" Tan-brown F SAND & SILT w/ Ash, Coal, Brick S-2: Dry 0-4" Dark brown Coal, Ash, Brick, Glass	Samples collected for laboratory analysis: B-11-r5A (0-1') PCBs B-11-r5A (1-3') PCBs B-11-r5A (0-3') EPH with target PAHs, vanadium	No wells were constructed during this event
15'								
20'								



Project:

169.2 Bridge Street (courtyard),
Lowell, MA
GEC project 1785-6080
Boring Log ID: B-11-r5B

Date of Work: <u>3-30-2016</u>

Weather: 40°F's, overcast

Boring Location: North east of B-11 on a 5' radius

Sheet: $\underline{1}$ of $\underline{1}$

Boring Contractor: New England Geotech, LLC

Foreman: Maynor

GEC Engineer: D. Foley

Drilling Method: Hand Geoprobe

Sampling: Various intervals with dedicated acetate Sleeves

Screening Equipment: MiniRae 3000 10.6 eV PID

Depth				l for analysis	S Cement Seal: Bentonite Se	eal: Sand Pack:	Slotted Screen:
	No. Pen./Rec.	LE Depth	Strata Change	Sample Screening	SAMPLE DESCRIPTION	ADDITIONAL NOTES	WELL CONSTRUCTION
5'	1 12/6° 2 24/12°	0-1°	URBAN		S-1: Dry 0-6" Dark brown-black Coal, Ash, Brick, Bits of shredded plastic S-2: Dry 0-6" Dark brown Coal, Ash, Brick, Glass w/ f Sand and Silt 6-12" Tan-black F SAND & SILT w/ Ash, Coal, Brick	Samples collected for laboratory analysis: B-11-r5B (0-1') PCBs B-11-r5B (1-3') PCBs B-11-r5B (0-3') EPH with target PAHs, vanadium	No wells were constructed during this event
15'							
20'							



Project:

169.2 Bridge Street (courtyard), Lowell, MA GEC project 1785-6080

Boring Log ID: B-11-r5C

Date of Work: <u>3-30-2016</u>

Weather: 40°F's, overcast

Boring Location: Southwest of B-11 on a 5' radius

Sheet: $\underline{1}$ of $\underline{1}$

Boring Contractor: New England Geotech, LLC

Foreman: Maynor

GEC Engineer: D. Foley

Drilling Method: Hand Geoprobe

Sampling: Various intervals with dedicated acetate Sleeves

Screening Equipment: MiniRae 3000 10.6 eV PID

	KEY	:	= Interva	l sampleo	l for analysi	S Cement Seal: Bentonite Sea	eal: Sand Pack:	Slotted Screen:
Depth	No.	SAMPI Pen./Rec.	LE Depth	Strata Change	Sample Screening	SAMPLE DESCRIPTION	ADDITIONAL NOTES	WELL CONSTRUCTION
5'		12/4" 24/12"	0-1' 1-3'	URBAN		S-1: Dry 0-4" Black Coal, Ash, Brick, Bits of Plastic, glass S-2: Dry 0-12" Dark brown-black Coal, Ash, Brick w/ some F Sand and Silt	Samples collected for laboratory analysis: B-11-r5C (0-1') PCBs B-11-r5C (1-3') PCBs B-11-r5C (0-3') EPH with target PAHs, vanadium	No wells were constructed during this event
15'				_				
20'								



Foreman:

Boring Contractor: GEC

GEC Engineer: D. Foley

Goldman Environmental Consultants, Inc. 60 Brooks Drive Braintree, MA

Project:

169.2 Bridge Street (courtyard).

Lowell, MA

GEC project 1785-6080

Boring Log ID: $\underline{B-12}$

Date of Work: <u>3-23-2016</u>

Weather: 40°F's, overcast

Boring Location: North-western portion of the courtyard, past the convergence of Picker and Boiler house, past the tin

Sheet: $\underline{1}$ of $\underline{1}$

Shack

Drilling Method: Auger and Hand-Geoprobe

Sampling: <u>Various intervals with dedicated acetate Sleeves</u>

Screening Equipment: MiniRae 3000 10.6 eV PID

K	ŒY:		= Interva	l sampleo	l for analysis	S Cement Seal: Bentonite S	eal: Sand Pack:	Slotted Screen:
Depth	No.	SAMPL Pen./Rec.	LE Depth	Strata Change	Sample Screening	SAMPLE DESCRIPTION	ADDITIONAL NOTES	WELL CONSTRUCTION
0	1	l2/pile	0-1: 1-3: 3-5: 5-6:	URBAN FILL	Due to recovery no Headspace was collected	S-1: Dry Dark brown-black f SAND & SILT, w/ Coal, w Ash, ~ 2" layer of Bits of Plastic S-2: Dry Gray fine SAND w/ tr Pebble, (appears to be structural fill) S-3: Dry 0-8" Gray f SAND w/ trace Gravel, Pebble 8-12" Urban fill, Sand and Silt, w/ Brick, Coal, Ash S-4: Moist 0-8" Dark Brown F SAND & SILT w/ Coal, Brick, Ash, Dust	Samples collected for laboratory analysis: B-12 (0-1') PCBs B-12 (1-3') PCBs B-12 (0-3') EPH w/ PAHs, Arsenic, Lead, Vanadium B-12 (3-6') EPH w/PAHs , Arsenic, Lead, Vanadium	No wells were constructed during this event



Foreman:

Boring Contractor: GEC

GEC Engineer: D. Foley

Goldman Environmental Consultants, Inc. 60 Brooks Drive Braintree, MA

Project:

169.2 Bridge Street (courtyard).

Lowell, MA

GEC project 1785-6080

Boring Log ID: B-13

Date of Work: <u>3-23-2016</u>

Weather: 40°F's, overcast

Boring Location: North-western portion of the courtyard, past the convergence of Picker and Boiler house, past the tin

Sheet: $\underline{1}$ of $\underline{1}$

Shack

Drilling Method: Auger and Hand-Geoprobe

Sampling: <u>Various intervals with dedicated acetate Sleeves</u>

Screening Equipment: MiniRae 3000 10.6 eV PID

	KEY	: 0000	= Interva	l sampleo	l for analysis	S Cement Seal: Bentonite Sea	eal: Sand Pack:	Slotted Screen:
Depth	No.	SAMPI Pen./Rec.	LE Depth	Strata Change	Sample Screening	SAMPLE DESCRIPTION	ADDITIONAL NOTES	WELL CONSTRUCTION
5',	500000	Pen./Rec. 1:2/pile 24/pile 8/24**	Depth 3:-3: 3:-5:	URBAN FILL	Due to recovery no Headspace was collected	S-1: Dry Dark brown-black f SAND & SILT, w/ Coal, w Ash, Bits of Plastic S-2: Dry Brown-black fine SAND & SILT w/ Bits of plastic, Brick, Coal, Ash, Glass S-3: Dry 0-8" Brown f-m-c SAND & SILT w/ Brick, Glass, Coal, Ash S-4: Moist 0-6" Gray f-m-c SAND & SILT w/ Coal, Brick, Ash, Dust, trace Clay	Samples collected for laboratory analysis: B-13 (0-1') PCBs B-13 (1-3') PCBs B-13 (0-3') EPH w/ PAHs, Arsenic, Lead, Vanadium B-13 (3-6') EPH w/PAHs , Arsenic, Lead, Vanadium	No wells were constructed during this event



Proiect:

169.2 Bridge Street (courtyard), Lowell, MA GEC project 1785-6100

Boring Log ID: B-14

Date of Work: 9-15-2016

Weather: 60°F's, mostly sunny

Boring Location Eastern Side of the Courtyard near the fuel

Sheet: $\underline{1}$ of $\underline{1}$

vaults

Boring Contractor: New England Geotech, LLC

Drilling Foreman: Ryan **GEC Staff:** D. Foley

Drilling Method: Track-mounted <u>Geoprobe</u>

Sampling: Continuous in five foot intervals with dedicated acetate Sleeves

	KEY	:	= Interva	l sampled	l for analysis	Cement Seal: Bentonite S	eal: Sand Pack:	Slotted Screen:
Depth	No.	SAMPI Pen./Rec.	LE Depth	Strata Change	Sample Screening	SAMPLE DESCRIPTION	ADDITIONAL NOTES	WELL CONSTRUCTION
5'	1	60/24	0-5"	Urban Fill	0.0 ppm	S-1: (dry) 0-24" Coal, Ash, Brick 12-24" # 6 fuel oil Smear started S-2: (dry)	Samples collected for laboratory analysis: B-14 (0-5') Comp B-14 (5-10') Comp B-14 (10-15') Comp B-14 (10-15') VOCs B-14 (15-16.5') Comp	No wells were constructed during this event
10'	<u> </u>	60/9	5-10'		0.0 ppm	0-9" Dark black URBAN FILL saturated w/ #6 product S-3: (dry)		
	3	60/12	10-15			0-2" Light brown f powdered SILT 10-12" Saturated URBAN FILL material. Fuel oil odor S-4: (dry)		
15'	4	18/12	15-16.5	REFUSAL	5.1 ppm	0-6" Pebble, oil & SAND & SILT 6-12" Very fine SILT, # 6 oil product, also exhibits "marine fishy" odor in center of gray silt		



Proiect:

169.2 Bridge Street (courtyard), <u>Lowell, MA</u> GEC project 1785-6100

Boring Log ID: $\underline{B-14A}$

Date of Work: 9<u>-16-2016</u>

Weather: 60°F's, partly sunny

Boring Location Eastern end of courtyard near fuel oil vaults

Sheet: $\underline{1}$ of $\underline{1}$

Boring Contractor: Crawford Drilling Services

Drilling Foreman: Ryan

GEC Staff: D. Foley

Drilling Method: Track-mounted Geoprobe

Sampling: Continuous in five foot intervals with dedicated acetate Sleeves

	KEY	:	= Interva	l sampled	for analysis	S Cement Seal: Bentonite S	eal: Sand Pack:	Slotted Screen:
Depth	No	SAMPL Pen /Rec		Strata Change	Sample Screening	SAMPLE DESCRIPTION	ADDITIONAL NOTES	WELL CONSTRUCTION
5°,	No. 1 2 2 3 3	Pen./Rec. 60/33 60/20 60/20	Depth 0-53 5-10 10-157	URBAN FILL	0.0 ppm 2.9 ppm 2.7 ppm	S-1: (dry) 0-15" Dry brown SAND & SILT & COAL & ASH, Brick, bits of Glass (Urban Fill) 17-33" #6 Oil saturated Sand, Silt, Coal, Ash, Brick, Slag S-2: (Moist) 0-9" Had H ₂ O & #6 Oil & Sheen 11-20" Tight URBAN FILL S-3: (Moist) #6 Oil Saturated, Black SAND & SILT, Coal and Ash and Brick (URBAN FILL)	NOTES Samples collected for laboratory analysis: B-14A (0-5') EPH, PAH, Asbestos, and PCBs B-14A (5-10') EPH, PAH, Asbestos, and PCBs B-14A (10-15') EPH, PAH, Asbestos, PCBs, and VOCs B-14A (15-16.5') EPH, PAH, Asbestos, and PCBs	No wells were constructed during this event
15'	242	18/9	15-16.50	REFUSAL	3.4 ppm	S-4: (Saturated) 0-3" Black saturated w/# 6 Oil and H ₂ O, URBAN FILL 3-9" Gray f SAND		



Proiect:

169.2 Bridge Street (courtyard), Lowell, MA GEC project 1785-6100

Boring Log ID: B-15

Date of Work: 9-15-2016

Weather: 60°F's, mostly sunny

Boring Location Eastern end of courtyard near fuel oil vaults

Sheet: $\underline{1}$ of $\underline{1}$

Boring Contractor: Crawford Drilling Services

Drilling Foreman: Ryan
GEC Staff: D. Foley

Drilling Method: Track-mounted Geoprobe

Sampling: Continuous in five foot intervals with dedicated acetate Sleeves

th		SAMPL	Æ	Strata	Sample	SAMPLE	ADDITIONAL	WELL
Depth	No.	Pen./Rec.	Depth	Change	Screening	DESCRIPTION	NOTES	CONSTRUCTION
	1	60/20	0-53	SAND & SILT		S-1: (dry) 0-20" Dark brown f-m SAND & SILT w/ sm Gravel & Pebble & Coal Dust & bits of Brick & Slag. Uniform	Samples collected for laboratory analysis: B-15 (0-5') PCBs B-15 (5-10') EPH and PAH and Asbestos, PCBs	No wells were constructed during this event
5'	_2	60/28	5-10'		\	S-2: (dry) 0-8" Black Coal Dust w/ SAND & SILT, tr Ground Stone, some Pebble and Brick, Coal, Ash, Slag, tr Organic 8-11" Brown gray, SAND & SILT & ASH, tr pebble 11-15" Gray tan, pulverized Rock 15-28" Black COAL DUST w/ SAND & Gravel, some Brick, Ash, Slag		
0'				REFUSAL				
15'								



Proiect:

169.2 Bridge Street (courtyard), <u>Lowell, MA</u> GEC project 1785-6100

Boring Log ID: B-16

Date of Work: 9-15-2016

Weather: 60°F's, mostly sunny

Boring Location Eastern end of courtyard near fuel vaults

Sheet: $\underline{1}$ of $\underline{1}$

Boring Contractor: Crawford Drilling Services D₁

Drilling Foreman: Ryan
GEC Staff: D. Foley

Drilling Method: Track-mounted Geoprobe

Sampling: Continuous in five foot intervals with dedicated acetate Sleeves

	KEY	: 0000	= Interva	l sampled	l for analysis	S Cement Seal: Bentonite S	eal: Sand Pack:	Slotted Screen:
Depth	No.	SAMPI Pen./Rec.	LE Depth	Strata Change	Sample Screening	SAMPLE DESCRIPTION	ADDITIONAL NOTES	WELL CONSTRUCTION
	1	60/40	0-53	SAND & SILT	0.0 ppm	S-1: (dry) 0-17" Brown SILT & SAND w/ Pebbles, Gravel, Brick, Coal, Ash 17-32" Black SAND & SILT w/ Pebble, Gravel, and coal Dust 32-33" Red powdered Sandstone 33-34" Yellow powdered Sandstone 34-40" Black Coal Dust w/ SAND & SILT, Pebble, Gravel	Samples collected for laboratory analysis: B-16 (0-5') PCBs B-16 (5-10') Asbestos, Held for PCBs B-16 (10-15') EPH and PAH, Held for PCBs	No wells were constructed during this event
5'	2	60/27	5-10		2.2 ppm	S-2: (dry) 0-3" Black coal Dust 3-5" Yellow Sandstone 5-13" URBAN FILL, Coal, Brick, Gravel 13-15" Coal, Dust 15-22" Light gray SAND w/ Gravel/pebble, some Urban Fill 22-27" Brown tran f SAND & SILT w/ tr Pebble (moist)		
10'	3	60/28	10-15°		7.4 ppm	S-3: (dry) 0-7" Brown tan f SAND & SILT w/ tr Pebble (moist), tight 7-11" Brown f SAND & SILT w/ Gravel 11-23" Gray busted rock w/ SAND & SILT 23" Dark brown SAND & SILT, Busted Rock, exhibits petroleum odor 23-28" Broken		
15'	4	24/0	15-17'	REFUSAL		S-4: (dry) Refusal at 17', no recovery		



Proiect:

169.2 Bridge Street (courtyard), <u>Lowell, MA</u> GEC project 1785-6100

Boring Log ID: B-17

Date of Work: 9-15-2016

Weather: 60°F's, mostly sunny

Boring Location Eastern end of courtyard near fuel vaults

Sheet: $\underline{1}$ of $\underline{1}$

Boring Contractor: Crawford Drilling Services Drilling Method:

Drilling Foreman: Ryan

GEC Staff: D. Foley

Drilling Method: Track-mounted Geoprobe

Sampling: Continuous in five foot intervals with dedicated acetate Sleeves

	KEY:	= Interval samp	oled for analysis	S Cement Seal: Bentonite S	eal: Sand Pack:	Slotted Screen:
Depth	SAMPI No. Pen./Rec.	Depth Strat		SAMPLE DESCRIPTION	ADDITIONAL NOTES	WELL CONSTRUCTION
5° 10° 15°	2. 60/20	SAN & SI SAN & SI S-7.8°	0.0 ppm	S-1: (dry) 0-6" Brown f SAND & SILT w/ Coal Dust and Pebbles 6-8" COAL & DUST 8-14" Brown f SAND & SILT w/ Gravel & Pebbles, tr Coal Dust 14-18" Black f SAND & SILT w/ Gravel & Pebbles and Coal Dust 18-21" Brown/black Gravel w/ Coal & Slag/Ash w/ SAND & Gravel S-2: (dry) 0-5" Dark Brown Coal Dust, Brick, Ash, SAND & SILT 5-20" Gray pulverized Rock, SAND & SILT	Samples collected for laboratory analysis: B-17 (0-5') EPH and PAH B-17 (5-7.5') EPH and PAH	No wells were constructed during this event



GEC Staff: D. Foley

Goldman Environmental Consultants, Inc. 60 Brooks Drive Braintree, MA

Proiect:

169.2 Bridge Street (courtyard), Lowell, MA GEC project 1785-6100

Boring Log ID: B-18

Date of Work: 9-15-2016

Weather: 60°F's, mostly sunny

Boring Location Eastern end of courtyard near fuel vaults

Sheet: $\underline{1}$ of $\underline{1}$

Boring Contractor: Crawford Drilling Services Drilling Method: Track-mounted Geoprobe

Sampling: Continuous in five foot intervals with dedicated acetate Sleeves

	KEY	: :::::::::::::::::::::::::::::::::::::	= Interva	l sampled	l for analysis	S Cement Seal: Bentonite Sea	eal: Sand Pack:	Slotted Screen:
Depth	No.	SAMPI Pen./Rec.	LE Depth	Strata Change	Sample Screening	SAMPLE DESCRIPTION	ADDITIONAL NOTES	WELL CONSTRUCTION
5'	2 	60/31	5-10°	SAND & SILT	0.0 ppm 0.0 ppm	S-1: (dry) 0-4" Gray f SAND w/ Pebbles 4-11" Black Coal Dust w/ gravel, Pebbles, f SAND & SILT, bits of Plastic 11-13" Red brown black Brick & Coal Dust w/ f SAND & SILT, bits of Coal and Ash 13-17" Black Coal Dust & Ash, Brick, bits of Glass 17-22" Brown Coal Dust w/ f SAND & SILT, some Pebble, tr Organic (rock) 22-31" Black Coal Dust/Bits of Ash, Brick, tr Pebble S-2: (dry) 0-11" Black Coal Dust, Orange stripe, F SAND/ DUST w/ Ash, Brick, Slag 11-12" Brown f SAND & SILT w/ Pebbles S-3: (dry) 0-5" Brown f SAND & SILT w/ pulverized rock, some COAL DUST, Brick, Ash 5-15" Brown/black COAL DUST w/ pulverized rock, SAND & SILT 15-28" Gray pulverized Rock w/ SAND, 1/2 inch roots at 25"	Samples collected for laboratory analysis: B-18 (0-5') PCBs B-18 (5-10') EPH and PAH, PCBs B-18 (10-14') PCBs	No wells were constructed during this event
15'				REFUSAL	0.0 ppm			



GEC Staff: D. Foley

Goldman Environmental Consultants, Inc. 60 Brooks Drive Braintree, MA

Proiect:

169.2 Bridge Street (courtyard), Lowell, MA GEC project 1785-6100

Boring Log ID: B-19

Date of Work: 9-15-2016

Weather: 60°F's, mostly sunny

Boring Location Eastern end of courtyard near fuel vaults

Sheet: $\underline{1}$ of $\underline{1}$

Boring Contractor: Crawford Drilling Services Drilling Method: Track-mounted Geoprobe

Sampling: Continuous in five foot intervals with dedicated acetate Sleeves

	KEY	: :::::::::::::::::::::::::::::::::::::	= Interva	l sampled	l for analysis	S Cement Seal: Bentonite Sea	eal: Sand Pack:	Slotted Screen:
Depth	No.	SAMPI Pen./Rec.	LE Depth	Strata Change	Sample Screening	SAMPLE DESCRIPTION	ADDITIONAL NOTES	WELL CONSTRUCTION
	1	60/39	0-5	Urban Fill	0.0 ppm	S-1: (dry) 0-7" Black URBAN FILL, Brick, Coal, Ash 7-9" c SAND & SILT to Gravel 9-15" URBAN FILL Coal Dust w/ Brick, Ash tr Pebble/Gravel 15-19" Broken Brick 19-39" Black Coal Dust w/ Brick/Concrete, Pebble & Gravel, SAND & SILT	Samples collected for laboratory analysis: B-19 (0-5') PCBs B-19 (5-10') Asbestos, EPH and PAH, PCBs B-19 (10-15') EPH and PAH, PCBs B-19 (15-17') EPH and PAH, PCBs	No wells were constructed during this event
5'		60/15	5-10	SAND & SILT	0.0 ppm	S-2: (dry) 0-3" Black Coal Dust w/ tr Gravel 3-8" Broken rock w/ tr Coal Dust, SAND & SILT 8-11" Black Coal Dust w/ tr Gravel 11-15" Broken rock w/ tr Coal Dust, SAND & SILT		
10'	3	60/26	10-15		0.0 ppm	S-3: (dry) 0-5" Broken rock 5-9" Gray tan broken rock, tr Coal Dust 9-26" Tan brown f-m-c SAND & SILT w/ Broken rock, tr Coal Dust		
15'	4	24/12	15-17		0.0 ppm	S-4: (dry) 0-1" Broken rock 1-4" Dark brown SILT & SAND w/ tr Organics 4-12" Brown f SAND & SILT w/ Gravel/pebbles and Coal		
				REFUSAL				



GEC Staff: D. Foley

Goldman Environmental Consultants, Inc. 60 Brooks Drive Braintree, MA

Proiect:

169.2 Bridge Street (courtyard), Lowell, MA GEC project 1785-6100

Boring Log ID: B-20

Date of Work: 9<u>-16-2016</u>

Weather: 60°F's, partly sunny

Boring Location Eastern end of courtyard near fuel vaults

Sheet: $\underline{1}$ of $\underline{1}$

Boring Contractor: Crawford Drilling Services Drilling Method: Track-mounted Geoprobe

Sampling: Continuous in five foot intervals with dedicated acetate Sleeves

	KEY	: 0000	= Interva	l sampled	for analysis	S Cement Seal: Bentonite Sea	eal: Sand Pack:	Slotted Screen:
Depth	No.	SAMPI Pen./Rec.		Strata Change	Sample Screening	SAMPLE DESCRIPTION	ADDITIONAL NOTES	WELL CONSTRUCTION
5' 10'	No. 1	Pen./Rec. :60/12	Depth :0-57		Screening			



GEC Staff: D. Foley

Goldman Environmental Consultants, Inc. 60 Brooks Drive Braintree, MA

Proiect:

169.2 Bridge Street (courtyard), Lowell, MA GEC project 1785-6100

Boring Log ID: B-21

Date of Work: 9-16-2016

Weather: 60°F's, partly sunny

Boring Location Eastern end of courtyard near fuel vaults

Sheet: $\underline{1}$ of $\underline{1}$

Boring Contractor: Crawford Drilling Services Drilling Method: Track-mounted Geoprobe

Sampling: Continuous in five foot intervals with dedicated acetate Sleeves

	K	EY:	= Interva	l sampled	l for analysis	S Cement Seal: Bentonite S	eal: Sand Pack:	Slotted Screen:
Donth	Depth	SAMPL No. Pen./Rec.		Strata Change	Sample Screening	SAMPLE DESCRIPTION	ADDITIONAL NOTES	WELL CONSTRUCTION
57	, , , , , , , , , , , , , , , , , , , ,	No. Pen./Rec. 1 60/19 2 60/17 3 42/16	Depth 0-5" 5-10' 10-13.5"	SAND & SILT	0.0 ppm 0.8 ppm 0.6 ppm	S-1: (dry) 0-19" URBAN FILL, Coal Dust, Ash, SAND & SILT & Bits of Brick/concrete S-2: (dry) 0-2" Brown SAND SILT, Coal Dust, Brick, Ash 2-4" pulverized Rock w/ SAND & SILT 4-8" Tan pulverized Sandstone & m-c SAND 8-11" Brown URBAN FILL, Coal, Dust, Brick, Slag, Ash 11-14" Brown Black, strong petrol odor, slight smearing, No # 6, SAND & SILT w/ Coal Dust, Brick, Ash 14-17" Brown black SAND & SILT w/ Coal, Ash, Crick, Pebble, Gravel S-3: (dry) 0-11" Brown/black Coal Dust w/ Brick, Ash, SAND & SILT (strong petrol odor) 11-16" pulverized Rock	NOTES Samples collected for laboratory analysis: B-21 (0-5') EPH and PAH, Asbestos, and PCBs B-21(5-10') EPH and PAH, Asbestos, and PCBs B-21 (10-13.5') EPH and PAH, Asbestos, and PCBs Extra Soil Added to Composite	No wells were constructed during this event



GEC Staff: D. Foley

Goldman Environmental Consultants, Inc. 60 Brooks Drive Braintree, MA

Proiect:

169.2 Bridge Street (courtyard), <u>Lowell, MA</u> GEC project 1785-6100

Boring Log ID: B-22

Date of Work: 9-16-2016

Weather: 60°F's, partly sunny

Boring Location Eastern end of courtyard near fuel vaults

Sheet: $\underline{1}$ of $\underline{1}$

Boring Contractor: Crawford Drilling Services Drilling Method: Truck-mounted Geoprobe

Sampling: Continuous in five foot intervals with dedicated acetate Sleeves

	KEY		= Interva	l sampled	for analysis	Cement Seal: Bentonite S	eal: Sand Pack:	Slotted Screen:
th		SAMPL	 LE	Strata	Sample	SAMPLE	ADDITIONAL	WELL
Depth	No.	Pen./Rec.	Depth	Change	Screening	DESCRIPTION	NOTES	CONSTRUCTION
	1	60/28	0-5'	SAND & SILT	0.0 ppm	S-1: (dry) 0-10" Brown Urban Fill, SAND & SILT w/ Coal, DUST, ASH, Concrete slag rock 11-14" Pulverized Brick 14-21" While yellow pulverized Sandstone and m-c SAND 21-25" pulverized Granite w/ m-c SAND & SILT 25-28" Brown SAND SILT Gravel w/ Brick, Coal	Samples collected for laboratory analysis: B-22 (10-15') EPH and PAH B-22 (15-20') EPH and PAH	No wells were constructed during this event
5'	2	60/24	5-10'		0.0 ppm	S-2: (dry) 0-2" Urban Fill SAND & SILT, Brick, Coal, Ash, Dust, Slag 2-4" Brick 4-24" Black COAL DUST w/ Brick, SAND & SILT, Ash, Slag		
10'	3	60/32	10-15"		0.0 ppm	S-3: (moist) 0-17" Dark brown Urban Fill, Coal, Ash, Brick, SAND & SILT 17-24" Brown gray fm-c SAND w/ Coal & Dust, tr Pebble 24-28" Wood 28-32" Brown gray fm-c SAND w/ Coal & Dust, tr Pebble		
15'	4	60/58:	15-20°		17.3 ppm	S-4: (moist) 0-11" Brown black SAND SILT, Gravel, tr Organics, exhibits petrol odor (gasoline) 11-58" Uniform gray f-m-c SAND, tr Pebble (appears native), tr Rounded Riverstone		
				REFUSAL				



GEC Staff: D. Foley

Goldman Environmental Consultants, Inc. 60 Brooks Drive Braintree, MA

Boring Contractor: Crawford Drilling Services

Proiect:

169.2 Bridge Street (courtyard), <u>Lowell, MA</u> GEC project 1785-6100

Boring Log ID: B-23

Date of Work: 9-16-2016

Weather: 60°F's, partly sunny

Boring Location Eastern end of courtyard near fuel vaults

Sheet: $\underline{1}$ of $\underline{1}$

Drilling Method: Track-mounted Geoprobe

Sampling: Continuous in five foot intervals with dedicated acetate Sleeves

	KEY	: 3333	= Interva	l sampled	l for analysis	S Cement Seal: Bentonite S	eal: Sand Pack:	Slotted Screen:
Depth		SAMPI		Strata Change	Sample Screening	SAMPLE DESCRIPTION	ADDITIONAL NOTES	WELL CONSTRUCTION
Q	No. 1	Pen./Rec. 60/40	Depth 0-5'	SAND & SILT	0.0 ppm	S-1: (dry) 0-10" Brown Painted wood chips, Urban Fill, Coal, Dust, Ash, SAND & SILT, Brick, Gravel, Concrete 10-16" Brown Gray f-m-c SAND & Gravel 16-30" Black Coal, Ash, Brick, Dust, Slag 30-31"Tan brown f SAND	Samples collected for laboratory analysis: B-23(5-9') EPH and PAH	No wells were constructed during this event
5'	2	48/40	5-9>		0.0 ppm	31-33" Black Coal, Dust, Brick, Slag, Ash 33-40" Tan brown f SAND w. some Gravel, tr Brick, Coal, Ash, Slag S-2: (dry) Tan brown f-m SAND w/ Gravel, tr Brick, Coal, Slag, Ash		
10'				REFUSAL				
15'								



Proiect:

169.2 Bridge Street (courtyard), Lowell, MA GEC project 1785-6100

Boring Log ID: $\underline{B\text{-}24}$

Date of Work: 9-16-2016

Weather: 60°F's, partly sunny

Boring Location Eastern end of courtyard directly next to fuel

Sheet: $\underline{1}$ of $\underline{1}$

vaults

Boring Contractor: Crawford Drilling Services

Drilling Foreman: Ryan

GEC Staff: D. Foley

Drilling Method: Track-mounted Geoprobe

Sampling: Continuous in five foot intervals with dedicated acetate Sleeves

	KEY	: :::::::::::::::::::::::::::::::::::::	= Interva	l sampled	l for analysis	S Cement Seal: Bentonite S	eal: Sand Pack:	Slotted Screen:
th		SAMPI	Æ	Strata	Sample	SAMPLE	ADDITIONAL	WELL
Depth	No.	Pen./Rec.	Depth	Change	Screening	DESCRIPTION	NOTES	CONSTRUCTION
	1	60/26	0-5'	URBAN FILL	0.0 ppm	S-1: (dry) 0-10" URBAN FILL– similar constituents to all other subsurface conditions 10-17" Brick 17-26" URBAN FILL	Samples collected for laboratory analysis: Soil used in composite sample	No wells were constructed during this event
5'	2	36/16	5-8'		0.0 ppm	S-2: (dry) 0-9" URBAN FILL 9-16" Gravel & Concrete		
				REFUSAL	•			
10'								
15'								
-								



Proiect:

169.2 Bridge Street (courtyard), Lowell, MA GEC project 1785-6100

Boring Log ID: B-25

Date of Work: 9-16-2016

Weather: 60°F's, partly sunny

Boring Location Eastern end of courtyard near fuel oil vaults

Sheet: $\underline{1}$ of $\underline{1}$

Boring Contractor: Crawford Drilling Services Drilling M

Drilling Foreman: Ryan

GEC Staff: D. Foley

Drilling Method: Track-mounted <u>Geoprobe</u>

Sampling: Continuous in five foot intervals with dedicated acetate Sleeves

	KEY	: 0000	= Interva	l sampled	l for analysis	S Cement Seal: Bentonite S	eal: Sand Pack:	Slotted Screen:
Jepth	No	SAMPI		Strata Change	Sample Screening	SAMPLE DESCRIPTION	ADDITIONAL NOTES	WELL CONSTRUCTION
5' 10'	No. 1	SAMPI Pen./Rec. 60/19	Depth 0-5'		Sample Screening 0.0 ppm 0.0 ppm		NOTES Samples collected for	



Proiect:

169.2 Bridge Street (courtyard), Lowell, MA GEC project 1785-6100

Boring Log ID: B-26

Date of Work: 9-16-2016

Weather: 60°F's, partly sunny

Boring Location Eastern end of courtyard near fuel oil vaults

Sheet: $\underline{1}$ of $\underline{1}$

Boring Contractor: Crawford Drilling Services

Drilling Foreman: Ryan

GEC Staff: D. Foley

Drilling Method: Track-mounted Geoprobe

Sampling: Continuous in five foot intervals with dedicated acetate Sleeves

]	KEY	: 00000	= Interva	l sampled	for analysis	S Cement Seal: Bentonite S	eal: Sand Pack:	Slotted Screen:
Depth	No.	SAMPI Pen./Rec.	LE Depth	Strata Change	Sample Screening	SAMPLE DESCRIPTION	ADDITIONAL NOTES	WELL CONSTRUCTION
I	1	60/22	0-5°	URBAN FILL	0.0 ppm	S-1: (dry) 0-14" URBAN FILL- similar constituents to all other subsurface conditions 14-22" evidence of petroleum sheen	Samples collected for laboratory analysis: B-26 (0-5') comp B-26 (5-10') comp B-26 (10-13') VOCs, comp	No wells were constructed during this event
5'	2	60/23	5-10		0.0 ppm	S-2: (dry) 0-10" URBAN FILL, # 6 present 10-23" Concrete	Soil used in composite sample	
10'	3.	36/0	10-13*		0.0 ppm	S-3: (dry) Moist URBAN FILL w/ petroleum		
15'				REFUSAL				



GEC Staff: D. Foley

Goldman Environmental Consultants, Inc. 60 Brooks Drive Braintree, MA

Proiect:

169.2 Bridge Street (courtyard), Lowell, MA GEC project 1785-6100

Boring Log ID: B-27

Date of Work: 9-16-2016

Weather: 60°F's, partly sunny

Boring Location Eastern end of courtyard near fuel oil vaults

Sheet: $\underline{1}$ of $\underline{1}$

Boring Contractor: Crawford Drilling Services Drilling Method: Track-mounted Geoprobe

Sampling: Continuous in five foot intervals with dedicated acetate Sleeves

	KEY	: 0000	= Interva	l sampled	l for analysis	S Cement Seal: Bentonite S	eal: Sand Pack:	Slotted Screen:
Depth	No	SAMPI		Strata Change	Sample Screening	SAMPLE DESCRIPTION	ADDITIONAL NOTES	WELL CONSTRUCTION
Ω	No.	Pen./Rec. 60/18	Depth 0-5'	URBAN FILL	0.0 ppm	S-1: (dry) 0-10" Dry URBAN FILL-similar constituents to all other subsurface conditions 10-18" URBAN FILL, exhibits 6 oil odor	Samples collected for laboratory analysis: B-27 (0-5') comp B-27 (5-10') VOCs, comp B-27 (10-11') comp	No wells were constructed during this event
5'	2	60/18	5-10'		0.0 ppm	S-2: (moist) 0-10" URBAN FILL 10-18" URBAN FILL exhibits 6 oil odor	Soil used in composite sample	
10'	3	12/12	10-11*	REFUSAL	-	S-3: (moist) 0-10" URBAN FILL 10-12" URBAN FILL, exhibits 6 oil odor		
15'								



GEC Staff: D. Foley

Goldman Environmental Consultants, Inc. 60 Brooks Drive Braintree, MA

Proiect:

169.2 Bridge Street (courtyard), Lowell, MA GEC project 1785-6100

Boring Log ID: B-28

Date of Work: 9-16-2016

Weather: 60°F's, partly sunny

Boring Location Eastern end of courtyard near fuel oil vaults

Sheet: $\underline{1}$ of $\underline{1}$

Boring Contractor: Crawford Drilling Services Drilling Method: Track-mounted Geoprobe

Sampling: Continuous in five foot intervals with dedicated acetate Sleeves

	KEY	: 0000	= Interva	l sampled	l for analysis	S Cement Seal: Bentonite S	eal: Sand Pack:	Slotted Screen:
Depth		SAMPI		Strata Change	Sample Screening	SAMPLE DESCRIPTION	ADDITIONAL NOTES	WELL CONSTRUCTION
Ď	No.	Pen./Rec.	Depth			S-1: (dry)	Samples collected for	No wells were
	1	60/14	0-5'	URBAN FILL	0.0 ppm	URBAN FILL- similar constituents to all other subsurface conditions no #6 present	laboratory analysis:	constructed during
							B-28 (5-10') VOCs, comp	this event
							B-28 (10-15') comp Soil used in composite	
							sample	
5'	2	60/24	5-10'		0.0 ppm	S-2: (dry) 0-18" URBAN FILL Dry, no #6 present 18-24" URBAN FILL, Fuel oil present		
10'						S 2. (1)		
10	3	60/6	10-15			S-3: (dry) 0-6" URBAN FILL, Saturated w/#6 oil		
15'	4	36/24	15-18			S-4: (dry) 0-16" URBAN FILL Fuel oil present 16-24" URBAN FILL, no sheen/ product observed		
						10-24 OKBAN FILL, no succió product observed		
				REFUSAL				



Project:

J-M Developer, LSI Picker Basement, Lowell, MA GEC project 1785-6070

Boring Log ID: $\underline{HB-1/SVP-1}$

Dates of Work: 2-12-2016

Weather: 10s°F Mostly Sunny

Boring Location: Picker Basement ~ 8' from north wall, ~20'

Sheet: $\underline{1}$ of $\underline{1}$

from eastern wall

Boring Contractor: New England Geotech

Foreman: Keith

GEC Engineer: Andrew Foley

Drilling Method: Hand GeoProbe

Sampling: Continuous in two foot intervals with dedicated acetate sleeves

Depth	No.	SAMPI Pen./Rec.	LE Depth	Strata Change	Sample Screening	SAMPLE DESCRIPTION	ADDITIONAL NOTES	WELL CONSTRUCTION
9	NO.	Pen./Rec.	Depth			Proposed 1st Floor Grade Vapor Barrier Clean Gravel— Radon System To be filled with flow able Gypcrete	THO TES	
5'	2	24/12° 24/6° 24/6°	0-2° 2-4 4-5°	SILT/ SAND/ FILL	0-2' = 1.6 ppm 2-4'= 1.7 ppm 4-5'= 1.5 ppm	Current basement Floor S-1: No odor, Moist 0-8"Brown-tan SILT w/ fine Sand 8-12" Dark brown-tan SILT w / Ash, Coal S-2: No odor, Moist 0-6" Brown SILT w/ fine Sand trace Pebble, trace Ash, coal S-3: No odor, Moist No recovery, Small Pile fine SAND	Sample collected for laboratory analysis: B-1 (0-5') VOCs w/ Targets, EPH w/ Targets	
0'				\P	Assumed Water Table		approximate depth screen and 10' of	1" soil vapor well to an of 15' BSG with 5' of of riser. Designated VP-1



Project:

J-M Developer, LSI Picker Basement, Lowell, MA GEC project 1785-6070

Boring Log ID: $\underline{HB-2/SVP-2}$

Dates of Work: 2-12-2016

Weather: 10s°F Mostly Sunny

Boring Location: Picker Basement ~ 35' from north wall,

Sheet: $\underline{1}$ of $\underline{1}$

~12' from eastern wall

Boring Contractor: New England Geotech

Foreman: Keith

GEC Engineer: Andrew Foley

Drilling Method: Hand GeoProbe

Sampling: Continuous in two foot intervals with dedicated acetate sleeves

	KEY				l for analysis		lon : Sand Pack:	Slotted Screen:
Depth	No.	SAMPI Pen./Rec.	LE Depth	Strata Change	Sample Screening	SAMPLE DESCRIPTION	ADDITIONAL NOTES	WELL CONSTRUCTION
		T CIII, NCC.	2000			Proposed 1st Floor Grade Vapor Barrier		
						Clean Gravel – Radon System To be filled with flow able Gypcrete		
),						Current basement Floor	-	
5,	3	24/6" 24/10"	0-2' 2-4' 4-5'	SILT/ SAND/ FILL	0-2' = 2.1 ppm 2-4'= 2.3 ppm 4-5'= 2.3 ppm	S-1: No odor, Moist 0-4" Brown-tan fine SAND & SILT 4-6" Broken concrete 6-8" Tan-brown fine SAND w/ tr. Ash,/ bits of coal S-2: No odor, Moist 0-6" Dark brown/ black w/ white fine SAND & SILT w/ tr Pebble, ash, bits of coal S-3: No odor, Moist 0-5" Brown-tan fine SAND w/ Silt trace Pebble 5-6" Black ASH w/ bits of coal	Sample collected for laboratory analysis: B-2 (2-5') VOCs w/ Targets, EPH w/ Targets	
o'					Assumed Water Table	6-10" Brown fine SAND w/ Silt, trace pebble	approximate depth screen and 10' of	1" soil vapor well to a of 15' BSG with 5' of of riser. Designated VP-2



Project:

J-M Developer, LSI Picker Basement, Lowell, MA GEC project 1785-6070

Boring Log ID: <u>HB-3/SVP-3</u>

Dates of Work: 2-12-2016

Weather: 10s°F Mostly Sunny

Boring Location: Picker Basement ~ 60' from north wall, ~7'

Sheet: $\underline{1}$ of $\underline{1}$

from eastern wall

Boring Contractor: New England Geotech

Foreman: Keith

GEC Engineer: Andrew Foley

Drilling Method: Hand GeoProbe

Sampling: Continuous in two foot intervals with dedicated acetate sleeves

KEY: = Interval sampled for analysis									
Depth	No.	SAMPI Pen./Rec.	E Depth	Strata Change	Sample Screening	SAMPLE DESCRIPTION	ADDITIONAL NOTES	WELL CONSTRUCTION	
						Proposed 1st Floor Grade Vapor Barrier Clean Gravel– Radon System To be filled with flow able Gypcrete			
0,						Current basement Floor			
5'	3 4	24/11" 24/14" 24/0" 24/6"	0-2' 2-4' 4-6' 6-7.5'	SILT/ SAND/ FILL	0-2' = 2.1 ppm 2-4'= 2.3 ppm 4-6'= 2.3 ppm	S-1: No odor, Moist 0-4" Tan fine SAND w/ trace Silt 4-8"Tan w/ black fine SAND w/ tr ash and coal 8-11" Brown fine SAND w/ Silt trace ash and coal S-2: No odor, Moist 0-4" Tan-brown fine SAND & BRICK w/ tr. Pebble, tr. Coal 4-14" Brown fine SAND & SILT w/ tr. Pebble S-3: No sleeve recovered Small pile fine SAND w/ Silt tr. Pebble	Sample collected for laboratory analysis: B-3 (2-7') VOCs w/ Targets, EPH w/ Targets		
10'				Assumed Water Table	6-7.5'= 3.0 ppm	S-4: No odor, Moist 0-4" Brown fine SAND w/ tr. Silt 4-5" Black fine SAND & SILT w/ coal 5-6" Brown fine SAND, saturated	B-3 completed as a 1" soil vapor well to an approximate depth of 17' BSG with 5' of screen and 12' of riser. Designated SVP-3		



Project:

J-M Developer, LSI Picker Basement, Lowell, MA GEC project 1785-6070

Boring Log ID: HB-4/SVP-4

Dates of Work: 2-12-2016

Weather: 10s°F Mostly Sunny

Boring Location: Picker Basement ~ 8' from north wall, ~8'

Sheet: $\underline{1}$ of $\underline{1}$

from eastern divider wall

Boring Contractor: New England Geotech

Foreman: Keith

GEC Engineer: Andrew Foley

Drilling Method: Hand GeoProbe

Sampling: Continuous in two foot intervals with dedicated acetate sleeves

Depth	No.	SAMPI Pen./Rec.	LE Depth	Strata Change	Sample Screening	SAMPLE DESCRIPTION	ADDITIONAL NOTES	WELL CONSTRUCTION
	110.	T CII./ NCC.	Верин			Proposed 1st Floor Grade		
-						Vapor Barrier Clean Gravel– Radon System		
						To be filled with flow able Gypcrete		
,					,	Current basement Floor		
-	1	24/0"	0-2'	SILT/ SAND/	0-2' = N/A	S-1: No recovery "void space"		
	2	24/12*	2-4'	FILL	IN/A	, old space		
,	3.	24/03	4-5°		2-4'= 3.1 ppm	S-2: No odor, Moist 0-10" Brown-black fine SAND & COAL & ASH w/ tr. Pebble 10-12" Tan-gray SILT w/ fine Sand, w/ Clay	Sample collected for laboratory analysis: B-4 (2-5') VOCs w/ Targets, EPH w/	
					4-5'= 3.3 ppm	S-3: No sleeve recovered Small pile of COAL & ASH, Rock, some fine Sand & Silt, tr. Clay	Targets	
)'				*	Assumed Water Table		approximate depth screen and 10' of	1" soil vapor well to a of 15' BSG with 5' of of riser. Designated VP-4



Project:

J-M Developer, LSI Picker Basement, Lowell, MA GEC project 1785-6070

Boring Log ID: $\underline{HB-5/SVP-5}$

Dates of Work: 2-12-2016

Weather: 10s°F Mostly Sunny

Boring Location: Picker Basement ~ 32' from north wall,

Sheet: $\underline{1}$ of $\underline{1}$

~40' from eastern divider wall

Boring Contractor: New England Geotech

Foreman: Keith

GEC Engineer: Andrew Foley

Drilling Method: Hand GeoProbe

Sampling: Continuous in two foot intervals with dedicated acetate sleeves

	C Ling	ineer: And	icw i oicy	-		Serecining Equipment. Minii-Rae 2000 10.0 CV 11D		
	KEY	:	= Interva	ıl sampleo	l for analysis	Cement Seal: Gravel/Radon : Sand Pack: Slotted So		
Depth	No.	SAMPI Pen./Rec.	LE Depth	Strata Change	Sample Screening	SAMPLE DESCRIPTION	ADDITIONAL NOTES	WELL CONSTRUCTION
						Proposed 1st Floor Grade Vapor Barrier Clean Gravel– Radon System To be filled with flow able Gypcrete		
0'	1	24/10"	0.2			Current basement Floor		
5'	3	24/10" 24/0" 24/0"	2-4 4-5	SILT/ SAND/ FILL	3.1 ppm 2-4'= 3.2 ppm 4-5'= 2.0 ppm	S-1: No odor, Moist 0-5" Brown-tan-gray fine SAND w/ Silt & pulverized concrete 5-10" Red-brown BRICK w/ fine Sand & Silt w/ tr. Coal S-2: No sleeve recovered Small pile brown fine SAND & SILT w/ tr. Brick tr. Clay S-3: No sleeve recovered Small pile of COAL & ASH, Rock, some fine Sand & Silt	Sample collected for laboratory analysis: B-5 (0-5') VOCs w/ Targets, EPH w/ Targets	
10'					Assumed Water Table		approximate depth screen and 10' of	1" soil vapor well to an of 15' BSG with 5' of of riser. Designated VP-5



Project:

J-M Developer, LSI Picker Basement, Lowell, MA GEC project 1785-6070

Boring Log ID: HB-6/SVP-6

Dates of Work: 2-12-2016

Weather: 10s°F Mostly Sunny

Boring Location: Picker Basement ~ 40' from north wall,

Sheet: $\underline{1}$ of $\underline{1}$

~26' from eastern divider wall

Boring Contractor: New England Geotech

Foreman: Keith

GEC Engineer: Andrew Foley

Drilling Method: Hand GeoProbe

Sampling: Continuous in two foot intervals with dedicated acetate sleeves

	KEY	SAMPI		l sampled Strata	I for analysis Sample	SAMPLE Gravel/Rad		Slotted Screen: WELL
Depth	No.	Pen./Rec.	Depth	Change	Screening	DESCRIPTION	ADDITIONAL NOTES	CONSTRUCTION
0° 5°		24/10"	2-4	SILT/ SAND/ FILL	0-2' = 2.5 ppm 2-4'= 2.4 ppm Assumed Water Table	Proposed 1st Floor Grade Vapor Barrier Clean Gravel— Radon System To be filled with flow able Gypcrete Current basement Floor S-1: No odor, Moist 0-7" Tan fine SAND 7-10" Brown-gray fine SAND tr. Clay tr. Coal S-2: No odor, Moist 0-5" Tan-brown fine SAND w/ tr. Coal, Ash, tr. Silt, tr. Pebble	approximate depth screen and 10' of	1" soil vapor well to an of 15' BSG with 5' of of riser. Designated VP-6